Section 17 Sevier River Basin
WATER CONSERVATION

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Section Seventeen Sevier River Basin- State Water Plan

Water Conservation

Water shortages, environmental issues, social values and competing uses have made users more aware of the need to use water wisely.

17.1 INTRODUCTION

This section discusses ways to conserve water and presents the value of making everyone aware of how to use it wisely. Conservation has been a way of life for many generations in Utah. When the early settlers carried water for household use, they learned to appreciate how far it was to the creek. The degree of conservation was determined by the number of trips one was willing to make.

Present day shortages caused by droughts, system failures or pollution episodes can be alleviated by having a plan to conserve water and stretch supplies to meet priority demands. It is important to recognize that significant water use reductions can be achieved when people understand the reasons to conserve. The public has demonstrated a willingness to temporarily reduce water use during times of drought. By educating the public on the benefits of implementing long-term water conservation efforts, and how to do it, people will be more likely to accept these programs and will provide support and funding necessary to implement them.

When water is inexpensive and plentiful, conservation is not popular, especially if additional costs are involved. During times of drought and where there is good reason, the public will respond over the short-term to a request to conserve.

Residents in the Sevier River Basin have always been aware of the limited water supply. Although developments of water resources for agriculture are expensive, developing water of high quality for culinary use is more expensive. These costs will increase in the future. Now is the time to consider the place of more water conservation.

17.2 BACKGROUND

To understand water conservation programs, there is a need to recognize the difference between diversions and depletions. Manmade diversions for irrigation, municipal, industrial and domestic uses must be sufficient to provide the water depleted along with any conveyance and delivery losses en route to the point of use. Most of these losses become return flow and are available for rediversion at some other point. Depletions consist of the water put to a use and consumed, and unavailable for return to the system. If a system were 100 percent efficient, diversions and depletions would be equal.

A well-managed conservation program for all public water uses may postpone or reduce the need for building new facilities and finding additional supplies. The most effective program combines incentives to conserve with conservation measures designed into the construction and operation of water supply systems.

Effective conservation programs combine activities designed to reduce the demand for water with measures to improve the efficiency of delivery systems. Demand reduction should include educating customers on improving irrigation practices, in-home use and landscape designs. Demand reduction is also more achievable with a pricing schedule that provides customers an incentive to use water more efficiently. Delivery efficiency can be improved by system audits and installing new meters and other facilities to reduce measurable losses.

Water quality is important in any water management program. If the goal is to conserve high quality water for meeting culinary growth demand, then providing a separate irrigation pipe network to substitute untreated water for lawn

and garden irrigation can be a logical solution. The total amount of water may be about the same, however, this saves the high quality water for culinary purposes and may reduce total costs.

The goal of a conservation measure may be aimed at either diversions, depletions, or both. This applies to both municipal and industrial water and to agricultural water.

17.2.1 Agricultural Water

Crop production is the largest use of water. Other large users include several large dairies and beef feedlots throughout the basin, a turkey processing plant in Moroni and a mushroom production facility near Fillmore.

Agricultural water users have been implementing conservation measures and facilities over the years. The measures include land leveling, on-farm and off-farm ditch and canal lining, sprinkler irrigation systems and gated pipe.

Farmers have been installing sprinkler irrigation systems to replace flood irrigation systems. Some of these systems serve lawns and gardens, such as the one in Glenwood, as well as agricultural land. There are many projects where canal lining and both pressure and gravity pipelines have been installed.

Exchanging a low-efficiency irrigation system for one more efficient may reduce the amount of water diverted while maintaining the amount of water depleted. This will leave more water in the stream for diversion downstream and will improve water quality. If the more efficient system increases crop depletion by providing a full water supply, return flows will be reduced even though diversions may also be reduced, although to a lesser extent.

There is a delicate balance within one or a group of irrigation systems where a change in either the supply, diversion or use will affect the others. Farmers who have sufficient supplies to meet crop requirements usually have no incentive to increase efficiency. However, improved efficiency can reduce costs. Saved water cannot be used to irrigate new land nor can it be sold to others if downstream water rights may be adversely affected. Saved water may be transferred to other uses and/or place of use if the appropriate laws and regulations are followed.

Water budgets prepared during 1989-90 indicate an overall irrigation efficiency of about 50 percent within each water-budget area. Current irrigation practices allow room for improvement in distribution and application efficiencies. The most widespread and effective conservation practice is scheduling irrigation based on the crop's need. This includes determining the crop consumptive use and irrigating to replenish the root-zone supply before the plant is stressed.

17.2.2 Municipal and Industrial Water

High quality municipal and industrial water is in short supply in some communities. Future growth will impact the current supply and the cost of developing additional water.

Culinary diversions can be reduced if users install water saving devices in the home. Installation of in-home water saving devices has been slow coming but it is now required by law. More lawn sprinkling systems are being installed but are often operated for convenience rather than to save water. Ordinances requiring watering only between the hours of 6:00 p.m. and 10:00 a.m. have been effective in reducing water use. Depletions can be reduced by using low water-using landscapes. The culinary water use in 1996 was 267 gallons per capita day (gpcd) with 50 percent used indoors.

Some cities and towns, such as Centerfield, are moving toward secondary systems to supply lawn and garden and some industrial uses with untreated quality water. Many of these systems are being converted to pipelines but there are still open ditch systems. This reserves the high quality water for culinary use. Secondary water use in 1996 was 153 gpcd compared to 56 gpcd statewide. The statewide use is low because nearly 60 percent of the state population used more culinary water for outside use; secondary water use was only about 12 gpcd. There are 12 communities in the basin where culinary water use is more than 400 gpcd.

Water rates (prices) may provide a strong incentive to use municipal water more

Table 17-1
WATER RATES FOR SELECTED COMMUNITIES IN THE SEVIER RIVER BASIN

City/Town	Base Rate ($)	Base Allocation (gallons)	First Overage ($)	For - gallons	Second Overage ($)/1,000 gallons	For - gallons	Third Overage ($)/1,000 gallons
Central	20	0					
Central WWC	15	30,000	.34	All			
Delta	14	8,000	.40	All			
Deseret-Oasis SSD	22	10,000	1.00	All			
Eureka	8.75	10,000	2.50	All			
Fillmore	12	10,000	.35	All			
Gunnison	13.50	15,000	.65	All			
Joseph	14.50	25,000	1.00	All			
Kanosh	11	20,000	.25	All			
Lynndyl	18	10,000	.75	All			
Milford	16.	10,000	.50	All			
Monroe	17	20,000	1.00	All			
Oak City	16	1,000	.30	20,000	.35	60,000	.60
Panquitch	16	15,000	.60	All			
Richfield	13.50	15,000	.35	50,000	.45	All	
Salina	17	7,500	.75	All			
Spring City	20	10,000	.45	15,000	1.00	All	

productively. Historically, rates have been low in this basin. Current rates are shown for 1997 in Table 17-1 for cities and towns where annual data is available.

Most communities provide little incentive for conservation with volume charges of less than $0.75 per 1,000 gallons. Only Deseret-Oasis SSD, Eureka, Joseph, Monroe and Spring City charge $1 .OO per 1,000 or more per 1,000 gallons.

Most industries provide their own water supply. In these cases, they tend to conserve water to reduce operation costs in order to be more competitive. It is not anticipated there will be large increases in industrial water demands.

17.3 WATER CONSERVATION OPPORTUNITIES

There are several methods and/or programs to conserve water. These include well-designed and operated systems and installation of water saving devices and practices. Structural and nonstructural means can be used to accomplish water conservation.

One program designed to promote water conservation was developed under the Central Utah Project Completion Act (CUPCA) Section 207. This program, the Conservation Credit Program, is administered by the Central Utah Water Conservancy District (CUWCD). Manti Irrigation Company has obtained $9.1 million for installation of a sprinkler irrigation system. This will conserve water for other uses. Also, a provision in Section 206 under CUPCA allows water users in Sevier River Basin counties belonging to the CUWCD to draw on taxes collected to construct water development projects. Both of these programs are based on a 35 percent cost-share by the water users. There are seven other applications for project funds in Sanpete County and one application from Garfield County.

The largest demand for additional water supplies will come from the municipal and industrial sector. This will also be the most costly whether it comes from groundwater or spring development. There may be a need for surface-water treatment facilities in the future.

Effective conservation should concentrate on reducing demand. For example, if the daily use per capita were reduced by 50 gallons per capita day, there would be an annual savings of more than 300 acre-feet or a constant flow of nearly 200 gallons per minute. At $100 per acre-foot development cost, this would be $30,000 per year.

Planting low water-using vegetation has the greatest potential for culinary water saving, especially where new construction is involved, and/or no secondary water is available. Outdoor use can be reduced by as much as 50 percent. Lawn watering guides can also show how to conserve water. Opportunities exist for reducing inside water use as well. Legislation requires water-saving fixtures such as low-flush toilets and low-flow shower heads in new construction or when old ones are replaced. The most effective way to establish a culinary water conservation program is under the direction of managers and elected officials responsible for public water supplies.

Agriculture provides the best opportunity for conservation of the largest volume of water. Farmers have been installing sprinkler irrigation systems at an increasing rate and finding them cost effective, especially where gravity pressure can be used. There is still room for improvement in distribution and on-farm irrigation efficiencies. Although this may be a water savings at the local level, it does not save water for the Sevier River Basin as a whole. Irrigation companies can reduce loss in distribution systems but the best method is by individual farmers increasing their on-farm efficiency.

An important element of any long-term water conservation program is public education. This can result in a public realization of the value of wasted water and reduced revenue and can build more public support for these programs. A big part of a public education program is simply just teaching how life works and how we depend on water for sustenance.

17.4 ISSUES AND RECOMMENDATIONS

There is considerable population growth in some areas which makes conservation an

important component of the plans for meeting future needs. Four policy issues are discussed below.

17.4.1 Community Water Management and Conservation Plans

Issue - Most communities do not have plans for improving the efficiency of water use in meeting future growth demands.

Discussion - Developing additional sources of water for residential use is costly due to additional restrictions on development. Conserving high quality water sources to serve portions of future growth will be increasingly competitive with the development of new supplies.

The 1997 Water Conservation Plan Act requires all conservancy districts and water retailers to prepare water conservation plans. These are to be submitted to the Division of Water Resources by April 1, 1999.

Water suppliers need to identify conservation goals in relation to supplies and demands. Alternatives to provide water to meet projected demands, including education and incentive pricing, should be identified. The Division of Water Resources has recently completed an inventory of present supplies, system capacities and has estimated projected demands. Refer to Section 11 for data on these items. This can be the basis for preparing a water supply and use plan with conservation as an important component. The plan should also look at including fringe areas in the public water system service area. In some cases, this will reduce the need for additional domestic wells.

Recommendation - Water management and conservation plans should be developed by all cities and towns.

17.4.2 Secondary Water Systems

Issue - Secondary water systems can reduce the demand for high quality water.

Discussion - Supplies of high quality culinary waters are limited and treating lower quality surface water is costly. For these reasons, public water suppliers should consider delivering low-quality water for outside uses. A large portion of existing municipal supplies are used for home landscape irrigation as well as large lawn areas such as parks, schools and churches where there is no need for water meeting culinary standards.

To meet future demands, supplies presently used by agriculture could be converted to secondary uses and eliminate the need to find more costly sources of higher quality water. Secondary water uses should be metered so their use can be controlled. This will delay or, in the case of some slower growing communities, may eliminate the need for developing more municipal water for many years, thus reducing future financial outlays.

Recommendation - Cities and towns should determine the feasibility of constructing secondary water systems.

Alternative landscaping conserves water

17.4.3 Water Conserving Landscaping

Issue - The use of water-conserving landscapes can reduce the need for limited supplies.,

Discussion - Landscapes use a major portion of the culinary water in most communities. Extensive turf, such as in yards, school grounds, park and golf courses has become the normal landscaping practice. Research reveals that most of these turf areas are over-watered, wasting up to 50 percent of the water applied.

More efficient irrigation and reduced turf acreages can conserve water and still maintain

appealing, attractive landscapes. Use of more efficient methods such as sprinkler and drip irrigation systems should be considered. The total amount of water applied per irrigation depends on the time and rate of application. Most residential water users are not aware of the amount of water required or how much is applied. Evaporation losses can be minimized by irrigating between the hours of 6:00 p.m. and 10:00 a.m. A study of the Bountiful area for a lo-year period before and a S-year period after watering was restricted to nighttime hours showed a 17 percent decrease in water use.

Water efficient landscaping uses a combination of native plants, low water using exotic or imported plants, mulched flower beds, hardscaping (decks, patios and rock gardens) and smaller selective turf areas to achieve a pleasing mix. Correctly designed landscaping can also meet the needs for recreation and entertainment areas along with beautification. This can reduce water use up to 50 percent of the amount required for a typical monoculture of turf grass. A list of low water using plants applicable to the Sevier River Basin can be obtained from nurseries and landscape designers in the area. In addition, the Division of Water Resources and Utah Extension Service have similar information available.

New residential construction lends itself best to low water using landscapes. Installation is more expensive than the current typical landscaping, but it will achieve an aesthetic, functional design. Installation costs can be recaptured through more economical operation and maintenance outlays. Replacing existing landscaping can be very costly; however, it does provide an opportunity to redecorate the outside areas while conserving water. Feasibility will depend on the cost of water and individual desires. Communities can take the lead by determining the amount of water uses on parks, golf courses and other large areas and demonstrate how water can be conserved. Water pricing (rate schedules) can also be designed to encourage use of low water-using landscapes.

Recommendation - Communities, especially the county seats, should determine current water use on large turf areas, install model water conserving landscape demonstration projects on city or county property and consider adopting a landscape ordinance.

17.4.4 Water Pricing

Issue - Some public water pricing programs can provide incentives for more efficient water use.

Discussion - A pricing strategy may be among the most powerful conservation tools at a water utility's disposal. Cities and other water suppliers are finding certain rate schedules can give an incentive to modify water use and customer behavior and meet conservation goals. Those responsible for maintenance of large areas of turf should be billed for the cost of water, even if it is the municipality. This would bring about recognition of the cost of water.

Conservation rate structures should have the following characteristics:

Equity - Each customer group will be treated the same, or must feel they are doing no more or no less than any other customer group. Each customer group may be assigned a goal which defines the upper limit of efficient water use. For residential customers, the goal is based on the number of people per household served and outdoor water needs.

Revenue Stability - This will avoid the decrease in revenue that traditionally accompanies conservation actions by customers. To avoid the negative impacts of the rise and fall of revenues directly linked to water sales, 100 percent of the fixed cost of a water system may be recovered with a basic charge. This charge is paid by all customers regardless of usage. Charges for water delivered through each meter are calculated separately. Revenue from metered sales must be sufficient to cover costs that vary with the amount of water used. With all fixed costs covered by a basic fee and variable system costs covered by metered sales revenue, revenue fluctuations from water use during droughts and periods of wet weather have fewer adverse consequences

Credibility - Success of any rate structure rests on the perception by customers that the system is

credible and based on scientific-principles. The rate structure should be based on defensible information that is logical, simple and is credible in the eyes of the customers. Credibility is gained by providing customers accurate data on water needs based on lot size and people served, along with continuous education about rates, incentives, penalties and the need for water efficiency.

Building a Conservation Ethic ▪ Utah's water supply and growth analysis by the Division of Water Resources shows conservation must be practiced now to delay expensive new water investments in the short term and chronic shortages in the future. Setting customer goals and providing pricing incentives that convey a clear conservation message builds a water efficiency ethic among customers. Through continuing education, customers generally understand that wasted water is expensive water. A rate structure with steep price increases above a base rate sets a price on inefficient water use. The combination of an equitable, logical and credible rate structure with price incentives to achieve goals, starts the process of building a long-term water conservation ethic.

Focusing efforts on helping culinary water users achieve low bills along with keeping rates as low as possible addresses the most fundamental issue in the minds of customers. While introduction of a conservation rate structure may increase phone calls and visits from customers, it increases the opportunity for culinary water providers to impact customers in a positive way. Customer calls can provide valuable information for correcting account information on number of people served and the landscaped area. This also provides opportunities for explaining how the customer can improve landscape watering or indoor water-use practices.

The impact of a well thought out conservation rate-structure by public water suppliers may save up to 15 percent for residential users and up to 45 percent for landscape irrigation.

Recommendation ▪ Most local water providers should adopt new water-rate schedules that encourage water conservation.